Understanding Diabetes Mellitus: An Occupational Therapists Perspective

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ABSTRACT

***Diabetes*** is associated with rapid fluctuations in blood glucose. Hyperglycemia is a frequent consequence of the relative or absolute insulin deficiency that is intrinsic to diabetes, and hypoglycemia is a common side effect of treatment with insulin and some antidiabetic medications. Because the brain is dependent on a continuous supply of glucose as its principal source of energy, changes in blood glucose concentration rapidly affect cerebral function. The adverse effects of acute hypoglycemia on cognitive function and on mood are recognized Occupational therapy practitioners can modify or adapt how their clients perform their desired self-care tasks to promote ease and success in achieving their goals in managing this disease. Occupational therapy focuses on lifestyle modification, health promotion, remediation of physical and visual impairments, and maximizing self-care independence, all of which are directly and adversely affected by diabetes and its complications.

Keywords— Cognition, Diabetes mellitus, Mood, Occupational Therapist, Quality of Life, , etc

# INTRODUCTION

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Type 2 diabetes mellitus (T2DM), formerly known as adult-onset diabetes, is a form of diabetes that is characterized by high blood sugar, insulin resistance, and relative lack of insulin. Common symptoms include increased thirst, frequent urination, and unexplained weight loss.



***Fig 1:*** *Universal symbol of Diabetes mellitus [1]*

Symptoms may also include increased hunger, feeling tired, and sores that do not heal [2]. Often symptoms come on slowly [3]. Long-term complications from high blood sugar include heart disease, strokes, diabetic retinopathy which can result in blindness, kidney failure, and poor blood flow in the limbs which may lead to amputations [4]. Type 2 diabetes primarily occurs as a result of obesity and lack of exercise [4]. Some people are more genetically at risk than others [3]. Type 2diabetes makes up about 90% of cases of diabetes, with the other 10% due primarily to type 1diabetes and gestational diabetes [4].

 In type 1 diabetes there is a lower total level of insulin to control blood glucose, due to an autoimmune induced loss of insulin-producing beta cells in the pancreas [9][10]. Diagnosis of diabetes is by blood tests such as fasting plasma glucose, oral glucose tolerance test, or glycated hemoglobin (A1C) [3]. Type 2 diabetes is largely preventable by staying a normal weight, exercising regularly, and eating properly [4]. Treatment involves exercise and dietary changes [4]. If blood sugar levels are not adequately lowered, the medication metformin is typically recommend [7], [8]. Many people may eventually also require insulin injections. In those on insulin, routinely checking blood sugar levels is advised; however, this may not be needed in those taking pills [9]. Bariatric surgery often improves diabetes in those who are obese. Rates of type 2 diabetes have increased markedly since 1960 in parallel with obesity [13]. As of 2015 there were approximately 392 million people diagnosed with the disease compared to around 30 million in 1985. Typically it begins in middle or older age [6] although rates of type 2 diabetes are increasing in young people. Type 2 diabetes is associated with a ten-year-shorter life expectancy [5]. Diabetes was one of the first diseases described [10]. The importance of insulin in the disease was determined in the 1920s.

# DIABETES AND ITS IMPACT ON SOME IMPORTANT ASPECTS OF DIABETICS

***Diabetes*** is associated with rapid fluctuations in blood glucose. Hyperglycemia is a frequent consequence of the relative or absolute insulin deficiency that is intrinsic to diabetes, and hypoglycemia is a common side effect of treatment with insulin and some antidiabetic medications [11]. Because the brain is dependent on a continuous supply of glucose as its principal source of energy, changes in blood glucose concentration rapidly affect cerebral function. The adverse effects of acute hypoglycemia on cognitive function and on mood are recognized [12, 13].

COGNITION is defined as integrated function of human mind that together results in thought and goal directed actions. It includes orientation attention memory higher level thinking abilities and meta processing abilities. People with type 2 diabetes are at risk of developing cognitive impairment. This is probably a consequence of synergistic interaction between metabolic derangements associated with diabetes and the structural and functional changes that occur within the central nervous system as part of the normal aging process. There were many researches carried out in proving the same & the most consistent finding was that verbal memory appears to be impaired in groups with Type 2 diabetes when compared with non-diabetic controls. Defined as memory tested by stimuli that are spoken or presented in another verbal format, verbal memory was significantly impaired in nine out of 15 studies in which it was tested [14].Although some studies have not demonstrated any cognitive impairment in people with Type 2 diabetes, no studies have found cognitive performance to be better in people with Type 2 diabetes compared with non-diabetic controls. Diabetes mellitus is a common condition in older people, affecting about 20% of persons older than 65 years. In cross-sectional studies(15),diabetes mellitus has been associated with various adverse health effects, including cognitive impairment.

MOOD is a sustained and pervasive emotion that, when extreme ,can colour one’s whole view of life. It is an affective state. In contrast to emotions or feelings, moods are less specific, less intense and less likely to be provoked or instantiated by a particular stimulus or event. Diabetes can affect a person's mood, causing rapid and severe changes. The symptoms of low blood sugar levels that might contribute to mood swings include: confusion, hunger, co-ordination and decision-making difficulties, aggression and irritability, personality or behavior changes, concentration difficulties. Signs that indicate a person may have high blood sugar levels include: difficulty thinking clearly and quickly, feeling nervous, feeling tired or having low energy. Changes in blood sugar level can affect a person's mood and mental status. When blood sugar returns to a normal range, these symptoms often resolve. Depression affects approximately 20–25% of patients with diabetes [16], with rates of major depressive disorder estimated at 12% and depressive symptoms at 15–35% [17]. The presence of depressive symptoms is associated with a poorer quality of life in patients with diabetes and has been shown to be associated with poorer glycemic control and diabetes complications [18]. The relationship between glycemic control and depression is likely bidirectional, but the causal pathways remain incompletely understood . Although poorer self-care among diabetes patients (e.g., adherence to lifestyle recommendations and glucose monitoring) is regarded as a potential contributor to poor glycemic control over time, it cannot fully account for poor control, as depression may also impact stress pathways which in turn can affect glycated hemoglobin (HbA1c) levels . Although major depressive disorder and depressive symptoms have generally been considered to be associated with poor glycemic control in type 2 diabetes mellitus (T2DM), the available data from cross-sectional studies on this association are inconsistent and methodological approaches vary across studies[17]. Diabetes-related distress refers to the emotional burden that may be an aspect of managing a chronic illness, and can be found in both those with diabetes and their caregivers.

QUALITY OF LIFE is defined as “the individual’s perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals”. and positive features of life. QOL has a wide range of contexts, including the fields of international development, healthcare, politics and employment. It is important not to mix up the concept of QOL with a more recent growing area of health related QOL (HRQOL). An assessment of HRQOL is effectively an evaluation of QOL and its relationship with health. Quality of life should not be confused with the concept of standard of living, which is based primarily on income. Health-related quality of life (HRQoL) is a multi- dimensional concept that includes domains related to physical, mental, emotional, and social functioning. It goes beyond direct measures of population health, life expectancy, and causes of death, and focuses on the impact health status has on quality of life. A related concept of HRQoL is well-being, which assesses the positive aspects of a person’s life, such as positive emotions and life satisfaction. The concept of health-related quality of life (HRQOL) and its determinants have evolved since the 1980s to encompass those aspects of overall quality of life that can be clearly shown to affect health—either physical or mental(18,19). On the individual level, HRQOL includes physical and mental health perceptions (e.g., energy level, mood) and their correlates— including health risks and conditions, functional status, social support, and socioeconomic status. On the community level, HRQOL includes community-level resources, conditions, policies, and practices that influence a population’s health perceptions and functional status. HRQOL questions have become an important component of public health surveillance and are generally considered valid indicators of unmet needs and intervention outcomes. Self-assessed health status is also a more powerful predictor of mortality and morbidity than many objective measures of health [20,21]. HRQOL measures make it possible to demonstrate scientifically the impact of health on quality of life. Quality of life is a broad-ranging concept affected in a complex way by a person’s physical health, psychological state, level of independence, social relationships and relationship to salient features of their environment [22] .Diabetes mellitus is a typical chronic medical condition that places serious constraints on patients’ activities. There is a need for extensive education and behaviour change to manage the condition. Lifestyle changes must incorporate careful dietary planning, eventual use of medication and for all patients with type 2 diabetes, the use of insulin and home blood glucose monitoring techniques. Studies have shown variability in the QOL effects of and 2 diabetes. For example, Gafvels found that patients with diabetes mellitus more frequently lived alone and remained childless, participated in fewer social activities, and indicated less personal satisfaction than control patients [23]. Other studies have found that patients with diabetes mellitus have good QOL in comparison to those with some other chronic diseases and even to healthy populations [24]. Mayou et al [25] and Hanasted [26] reported that the majority of patients with type 1 and type 2 diabetes mellitus experience a high degree of well-being, satisfaction, and enjoyment, although a minority noted that aspects of their lives were negatively affected by both forms of diabetes mellitus. The treatment of diabetes mellitus appears to have a complex effect on QOL. Jacobson et al found that patients with type 2 disease taking oral agents worried more about their condition than patients receiving insulin treatment orthose treated by diet modification alone, suggesting the possibility that this transitional period was one in which the reality of having an illness was felt most intensely by patients [26]. The same study also reported that insulin treatment of type 2 disease led to decreased satisfaction with HRQOL and greater impact of the illness. Mayou et al found little difference in the QOL between patients treated by diet, oral agents, or insulin therapy [24].

# DIABETES MELLITUS & OCCUPATIONAL THERAPY

In recent time’s major portion of population diagnosed with Diabetes mellitus. Diabetes mellitus is associated with adverse health effects leads to physical, psychological and emotional problems. An occupational therapist can play very important role in management of Type-2 diabetes mellitus and can effectively educate and train persons at risk for or who currently have diabetes to modify current habits and routines and develop new ones to promote a healthier lifestyle and minimize disease Progression.

Occupational therapy can be provided in a wide range of settings, such as a client’s home, an outpatient clinic, or a hospital. It can also be provided through a program that focuses on wellness and prevention or one that focuses on medical treatment and rehabilitation for complications resulting from diabetes. Sometimes occupational therapy is available in a more specialized setting such as a diabetes clinic or low vision program. Services can be provided on a one-to-one basis or within a group and, depending on the topic, can include oral instruction, demonstration, hands-on experiences, group activities, and role playing. Occupational therapy practitioners are experts at analyzing the performance skills and patterns necessary for people to engage in their everyday activities (occupations). They can effectively educate and train persons at risk for or who currently have diabetes to modify current habits and routines and develop new ones to promote a healthier lifestyle and minimize disease progression. Occupational therapy practitioners can assist clients to develop simple, concrete, measurable, and achievable self- management goals consistent with the seven behaviors advocated by the **American Association of Diabetes Educators (AADE).** These AADE 7TM Self-Care Behaviors are:

(1) Healthy eating,

(2) Being active,

(3) Monitoring,

(4) Taking medications,

(5) Problem solving,

(6) Healthy coping, and

(7) Reducing risks [27].

Some behaviors, such as healthy eating, are self-explanatory, whereas others are more involved. For example, monitoring includes not only blood glucose testing but also tracking blood pressure, weight, foot health, and “steps walked” to ensure the person is getting enough physical activity. Similarly, reducing risks encompasses a diverse group of behaviors including, but not limited to, smoking cessation; foot self- inspections; maintenance of personal health records; and regular eye, foot, and dental exams, creating a need for clients to track and diligently attend appointments with their diabetes health care team. According to AADE’s disabilities position statement, occupational therapy practitioners are viewed as part of the diabetes self-care team [28]. Occupational therapy practitioners are knowledgeable about the impact of medical conditions on an individual’s day-to-day and long-term functioning. Through their holistic approach they address the physical, cognitive, psychosocial, and sensory aspects inherent in the performance of everyday life activities. Occupational therapy practitioners develop a collaborative relationship with their clients to prioritize what they want and need to accomplish—which is critical in a disease requiring self-management 24 hours per day, 7 days per week. Occupational therapy practitioners can modify or adapt how their clients perform their desired self-care tasks to promote ease and success in achieving their goals in managing this disease. Occupational therapy focuses on lifestyle modification, health promotion, remediation of physical and visual impairments, and maximizing self-care independence, all of which are directly and adversely affected by diabetes and its complications. Occupational therapy practitioners focus on helping clients take charge of their diabetes as opposed to being controlled by it, so they can participate in everyday activities.



**Fig 2:** Diagnosis of type-2 Diabetes mellitus [29]

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